Maine Department of Transportation
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Technical Report ME 99-6, Evaluation of the Effects of Development on Peak Flow Hydrographs for Collyer Brook, Maine. The development of former agricultural or forested lands creates more impervious areas and drainage improvements that can increase the volume of runoff and decrease infiltration and groundwater recharge in a watershed. Drainage improvements also can improve the conveyance of runoff, decreasing the time of rise to peak flow between the start of a rainfall event and the peak surface-water runoff, and likewise decreasing the duration of the peak-flow event. The watershed of Collyer Brook in Southern Maine was studied to evaluate the effect of land-use changes on peak-flow hydrographs because of the known development in the area during the past 35 years and the availability of aerial photos and stream flow data for this time period. Between 1964 and 1999 the impervious area of the watershed more than doubled in size. However this area is still only 3-1/2 percent of the entire watershed (20 square miles). Although aerial photography indicates that suburban development has increased in the watershed between 1964 and 1999, the overall effect of suburbanization on rainfall-runoff processes in the watershed did not produce a statistically detectable change in the peak-flow hydrographs for Collyer Brook.

Technical Report ME 96-2, Longitudinal Joint Study for Hot Mix Asphalt Pavements. In previous years there has been a problem with longitudinal joint deterioration of HMA pavements, due in part to poor construction techniques. The degradation of the longitudinal joints has increased the cost of maintaining these projects and caused unnecessary reflective cracking when overlaid. To reduce the effects of this type of cracking test and control sections were constructed along U.S. Route 1A between the towns of Caswell and Van Buren. The sections consisted of TransTech Systems' Joint Maker as well as various hot mix asphalt rolling techniques to increase longitudinal joint densities and overall performance. Overall the project has performed well over the five-year study with the exception of a few areas in Section VI (edge trim). The paving crew on this project was one of the most conscientious paving crews in the area, which helped produce a stable centerline joint regardless of the rolling technique. If a paving crew paid attention to minor details of placing and rolling mix properly the centerline joint as well as the entire mat will be stable and withstand time and daily traffic. It should be noted when this project was paved in 1996 MaineDOT used Hveem designed Grade "C" mix we now use Superpave mix. Grade "C" mix is finer than Superpave making it easier for the Joint Maker to precompact. TransTech has had difficulty precompacting Superpave mix using the Joint Maker and is working on developing a Joint Maker for Superpave mix.

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Technical Report ME 02-2, Using Foamed Asphalt as a Stabilizing Agent in Full Depth Reclamation of Route 8 in Belgrade. In 2001, a full depth reclamation project utilizing foamed asphalt stabilization was constructed along Rt. 8 in Belgrade, Maine. The Department has become dependent on full depth reclamation as a cost effective treatment on many miles of highway rehabilitation. Stabilizers such as emulsions, cement and calcium chloride have been used in the past to improve performance of FDR treatments. The advantages of foamed asphalt include a more uniform, homogenous material, increased structural capacity and less curing time over traditional stabilizers. On the Rt. 8 project, the foamed asphalt laboratory plant was used to determine optimum asphalt content for the FDR materials. Test sections were constructed that will allow MaineDOT to measure performance of foamed asphalt treated FDR and compare it to more traditional treatments. Five years of monitoring is planned.

Innovative Bridge Deck in Washington - Union, Maine. An innovative bridge deck using glue laminated wood timbers sandwiched between two fiber reinforced polymer layers was recently installed on steel beams at Skidmore Bridge on the Washington - Union town line. Glulam wood deck panels have been used in bridge construction for years. The panels are placed perpendicular to the direction of traffic. Several other state DOT's have experimented with deck systems that are made solely with fiber reinforced polymer (FRP) composites. They have proven to be light weight and resistant to corrosive environments. However they are far more expensive than conventional reinforced concrete decks. The innovative deck at Skidmore Bridge uses both of these technologies and will hopefully provide a cost competitive system to traditional construction. The deck panels were constructed of 2"x 10"southern yellow pine and laminated together. The panels, themselves, are 4 feet in width by 24 feet long.

They were shipped to a composites manufacturer for the application of the FRP to both sides of the panels. The FRP will add strength to the wood panels and will provide protection from the elements. Studies have shown that an FRP layer can increase the strength of wood beams twofold. For the wood panels, the addition of FRP boosted the strength by 30%. To complete the deck a polymer concrete surface was applied to the topside of the panels. UMaine's Advanced Engineering Wood Composites Center along with DOT engineers designed the bridge that presented many interesting challenges and details. The deck was overlain with hot mix asphalt pavement prior to opening for traffic. UMaine and DOT will evaluate the performance of this bridge over the coming years.

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